RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER **No. 314-18-1672c** dated 30.11.2021

Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships, 2021, ND No. 2-020101-138-E in connection with coming into force of IACS UR A1 (Rev.7 Corr.1 Sep 2021) and A2 (Rev.5 Sep 2020)

Item(s) of supervision:

ships under construction

Entry-into-force date:
01.01.2022

~~Cancels / amends / adds Circular Letter No.~~ ~~dated~~

Number of pages: 1+8

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Part II "Hull" and Part III "Equipment, Arrangements and Outfit"

Director General Konstantin G. Palnikov

Text of CL:

We hereby inform that the Rules for the Classification and Construction of Sea-Going Ships shall be amended as specified in the Appendices to the Circular Letter.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, interested organizations and persons in the area of the RS Branch Offices' activity.
2. Apply the provisions of the Circular Letter during review and approval of the technical documentation on ships contracted for construction or conversion on or after 01.01.2022, in the absence of a contract, the keels of which are laid or which are at a similar stage of construction on or after 01.01.2022.

List of the amended and/or introduced paras/chapters/sections:

Part II: paras 2.11, 2.11.4 and 2.11.5;

Part III: paras 3.2.1, 3.2.3, 4.3.1, 4.3.4.1, 4.3.4.4, 4.3.5, 4.3.6, 4.5.2, 5.3.4, 5.3.7 and 5.3.8.1

Person in charge: Dmitry V. Kalinkin 314 +7 812 6050529 ext. 2207

"Thesis" System No. 21-275100

Appendix 1 to Circular Letter
No. 314-18-1672c dated 30.11.2021

Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)

Nos.	Amended paras/chapters/ sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Para 2.11	Chapter has been renamed	314-18-1672c of 30.11.2021	01.01.2022
2	Para 2.11.4	New para containing requirements for deck supporting deck structures intended to be used for mooring and towing equipment has been introduced	314-18-1672c of 30.11.2021	01.01.2022
3	Para 2.11.5	New para containing requirements for deck supporting deck structures intended to be used for anchor windlasses and chain stoppers has been introduced	314-18-1672c of 30.11.2021	01.01.2022
4	Para 3.2.1	Para has been amended considering IACS UR A1 (Rev.7 Corr.1 Sep 2021)	314-18-1672c of 30.11.2021	01.01.2022
5	Para 3.2.3	Para has been amended considering IACS UR A1 (Rev.7 Corr.1 Sep 2021)	314-18-1672c of 30.11.2021	01.01.2022
6	Para 4.3.1	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
7	Para 4.3.4.1	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
8	Para 4.3.4.4	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
9	Para 4.3.5	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
10	Para 4.3.6	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
11	Para 4.5.2	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
12	Para 5.3.4	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022
13	Para 5.3.7	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022

Nos.	Amended paras/chapters/ sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
14	Para 5.3.8.1	Para has been amended considering IACS UR A2 (Rev.5 Sep 2020)	314-18-1672c of 30.11.2021	01.01.2022

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2021

ND No. 2-020101-138-E

PART II. HULL

2 GENERAL REQUIREMENTS FOR HULL STRUCTURES

1 The title of **Chapter 2.11** is replaced by the following text:

"**2.11 SEATINGS FOR MACHINERY AND BOILERS, SUPPORTING HULL STRUCTURES FOR EQUIPMENT, MACHINERY AND ARRANGEMENTS**".

2 New **paras 2.11.4 — 2.11.5** are introduced reading as follows:

"**2.11.4 Supporting deck structures for mooring and towing equipment.**

2.11.4.1 The requirements shall apply to deck structures of mooring and towing equipment (bollards, bitts, fairleads, stand rollers, chocks, capstans, winches) installed on board the ships covered by SOLAS excluding high-speed craft, special purpose ships and MODU/FOP of all types, and designed to conduct normal towing and mooring operations associated with manoeuvring in ports or sheltered waters as well as associated with escort towing including canal transit towing and emergency towing.

2.11.4.2 Supporting deck structures of mooring and towing equipment shall be checked by means of finite element analysis or by means of grillage analysis taking into account the following:

.1 when preparing design model, the corrosion allowance taken according to 1.1.5 for deck or bulwark as applicable, shall be deducted from the as-built deck thickness;

.2 design load is taken:

for structures beneath towing equipment in accordance with 5.3.7of Part III "Equipment, Arrangements and Outfit". In this regard, consideration shall be given to the cases when the load is applied vertically or horizontally. The acting point of the load shall be determined in accordance with 5.3.5 of Part III "Equipment, Arrangements and Outfit";

for structures beneath mooring equipment in accordance with 4.3.4 of Part III "Equipment, Arrangements and Outfit". In this regard, consideration shall be given to the cases when the load is applied vertically or horizontally. The acting point of the load shall be determined in accordance with 4.3.4 of Part III "Equipment, Arrangements and Outfit";

.3 for strength assessment by means of grillage analysis, normal stress shall be assumed equal to the sum of bending stress and axial stress. No stress concentration factors shall be taken into account. Normal stress shall not exceed yield R_{eH}. Shear stress — $0{,}6\,R_{eH}$;

.4 for strength assessment by means of finite element analysis, Von Mises stresses in supporting hull structures shall not exceed R_{eH}. In this case, the design model shall meet the following requirements:

the mesh is to be fine enough to represent the geometry as realistic as possible;

the aspect ratio of elements shall not exceed 3;

girders shall be modelled by using shell or plane stress elements. Symmetric girder flanges may be modelled by beam or truss elements;

girder web depth shall be divided at least into three elements. In way of small openings (less than finite element dimensions) in girder webs the web thickness shall be reduced to a mean thickness. Large openings shall be modelled taking into account their geometry;

primary members may be modelled by using shell, plane stress, or beam elements;

the mesh size of primary members shall be sufficient to obtain proper bending stress;

if flat bars are modeled using shell or plane stress elements, dummy rod elements shall be modelled at the free edge of the flat bars and the stresses of the dummy elements shall be

evaluated. Stresses shall be read from the centre of the individual finite element. For shell elements the stresses shall be evaluated at the mid plane of the element.

2.11.5 Supporting deck structures for anchor windlasses and chain stoppers.

2.11.5.1 The supporting deck structure of anchor windlass and chain stopper shall be checked by means of finite element analysis or by means of grillage analysis taking into account the following:

.1 design loads shall be equal to:

for chain stopper — 80 % of the chain cable breaking load;

for windlass, where no chain stopper is fitted or the chain stopper is attached to the windlass — 80 % of the chain cable breaking load;

for windlass, where chain stoppers are fitted but not attached to the windlass — 45% of the chain cable breaking load.

The design loads shall be applied in the direction of the chain cable.

Sea loads acting on anchor windlasses shall also be considered and determined in accordance with 6.3.5, Part IX "Machinery";

.2 when preparing design model, the corrosion allowance 1.1.5 for deck shall be deducted from the as-built deck thickness. For ships covered by the IACS Common Structural Rules the corrosion addition is determined in accordance with the IACS Common Structural Rules;

.3 calculations shall be performed in accordance with the provisions of 2.11.4.2.3 and 2.11.4.2.4.".

PART III. EQUIPMENT, ARRANGEMENTS AND OUTFIT

3 ANCHOR ARRANGEMENT

3 **Para 3.2.1** is replaced by the following text:

"**3.2.1** The Equipment Number EN for all ships other than floating cranes and tugs, is determined by the formula

$$EN = \Delta^{\frac{2}{3}} + 2\left(hB + S_{fun}\right) + \frac{A}{10} \qquad (3.2.1\text{-}1)$$

where Δ – moulded displacement, in t, to the summer load waterline;

B – breadth of the ship, in m;

h – effective height, in m, from the summer load waterline to the top of the uppermost deckhouse, in m, which is determined by the formula

$$h = a + \sum h_i \qquad (3.2.1\text{-}2)$$

where a – vertical distance at hull side, in m, from the summer load waterline amidships to the upper deck;

h_i – height, in m, at the centreline of each tier of superstructures or deckhouses having a breadth greater than $B/4$, for the lowest tier h_1 shall be measured at the centreline from the upper deck or from a notional deck line where there is local discontinuity in the upper deck, refer to Fig. 3.2.1-1;

S_{fun} – effective front projected area of the funnel, in m², determined by the formula:

$$S_{fun} = A_{FS} - S_{shield} \qquad (3.2.1\text{-}3)$$

A_{FS} – front projected area of the funnel, in m², calculated between the upper deck at centreline, or notional deck line where there is local discontinuity in the upper deck, and the effective height h_F. A_{FS} is taken equal to zero if the funnel breadth is less than or equal to $B/4$ at all elevations along the funnel height;

h_F – effective height of the funnel, in m, measured from the upper deck at centreline, or notional deck line where there is local discontinuity in the upper deck, and the top of the funnel.
The top of the funnel may be taken at the level where the funnel breadth reaches $B/4$.

S_{shield} – the section of front projected area A_{FS}, in m², which is shielded by all deckhouses having breadth greater than $B/4$. If there are more than one shielded section, the individual shielded sections, i.e. $S_{shield1}$, $S_{shield2}$ etc. as shown in Fig. 3.2.1-2 shall be added together. To determine S_{shield}, the deckhouse breadth is assumed B for all deckhouses having breadth greater than $B/4$ as shown for $S_{shield1}$, $S_{shield2}$ in Fig. 3.2.1-2;

A – side projected area, in m^2, of the hull, superstructures, deckhouses and funnels above the summer load waterline which are within the equipment length of the ship L and also have a breadth greater than $B/4$. The side projected area of the funnel is considered in A when A_{FS} is greater than zero. In this case, the side projected area of the funnel shall be calculated between the upper deck, or notional deck line where there is local discontinuity in the upper deck, and the effective height h_F.

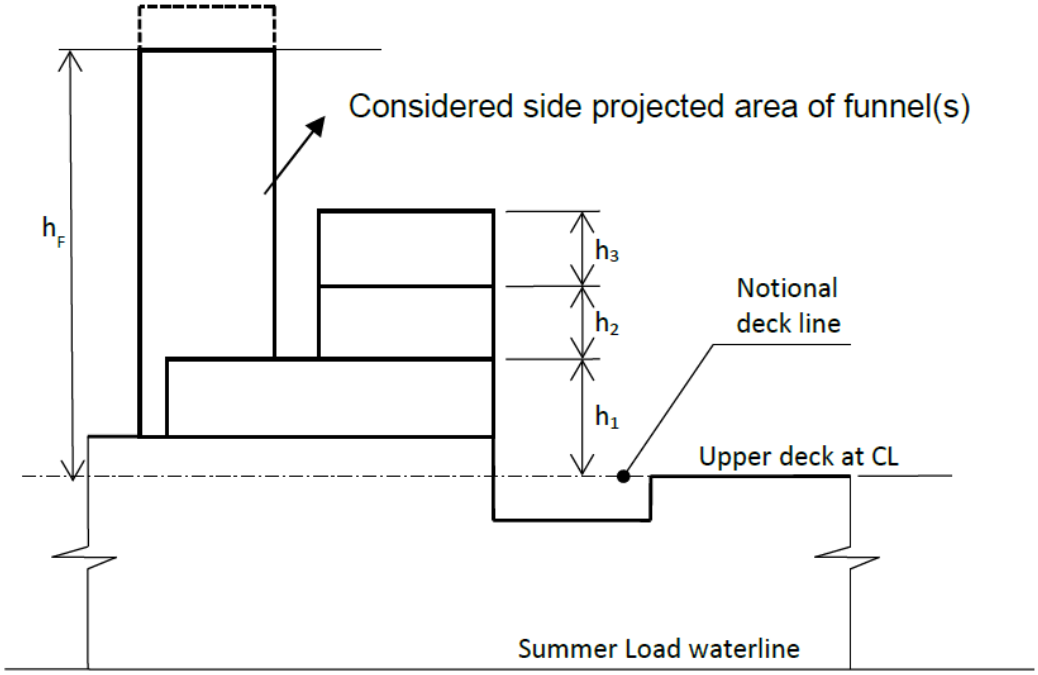

Fig. 3.2.1-1

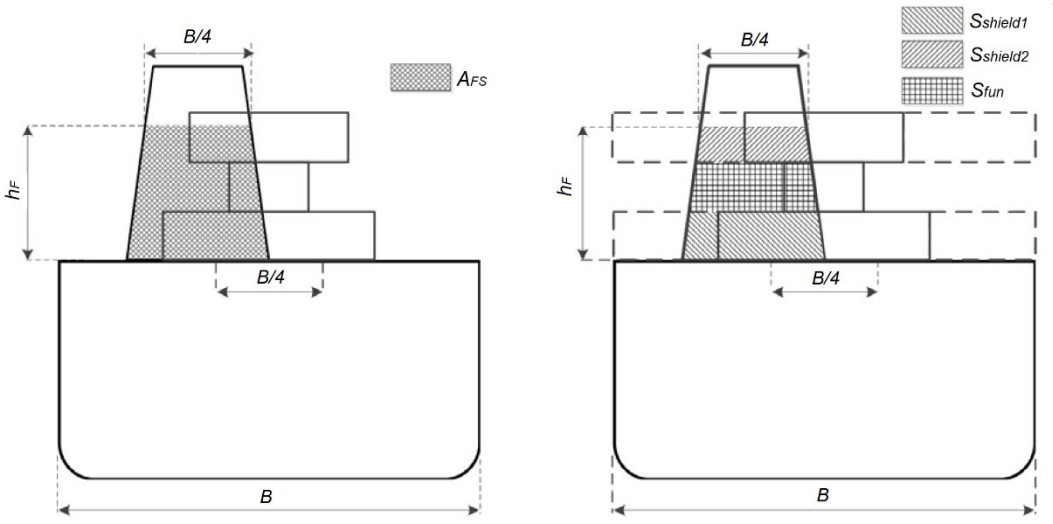

Рис. 3.2.1-2

Notes:

1. When calculating h, sheer and trim shall be ignored, i.e. h is the sum of freeboard amidships plus the height (at centreline) of each tier of houses having a breadth greater than $B/4$.
2. If a house having a breadth greater than $B/4$ is above a house with a breadth of $B/4$ or less, then the wide house shall be included but the narrow house ignored.
3. Screens or bulwarks 1,5 m or more in height shall be regarded as parts of houses when determining h and A. The height of the hatch coamings and that of any deck cargo, such as containers, may be disregarded when determining h and A.
   With regard to determining A, when a bulwark is more than 1,5 m high, the area shown as A_2 (refer to Fig. 3.2.1-3) shall be included in A.

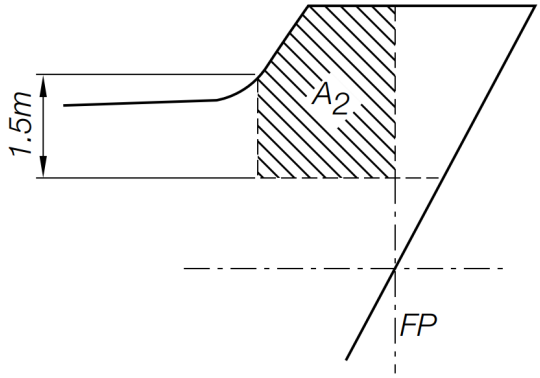

Fig. 3.2.1-3

4. The equipment length of the ship is the length between perpendiculars but shall not be less than 96 % nor greater than 97 % of the extreme length on the summer load waterline (measured from the forward end of the waterline).
5. When several funnels are fitted on the ship, the above parameters are taken as follows:
   h_F — effective height of the funnel, in m, measured from the upper deck, or notional deck line where there is local discontinuity in the upper deck, and the top of the highest funnel. The top of the highest funnel may be taken at the level where the sum of each funnel breadth reaches $B/4$;
   A_{FS} — sum of the front projected area of each funnel, in m², calculated between the upper deck, or notional deck line where there is local discontinuity in the upper deck, and the effective height h_F.
   A_{FS} shall be taken equal to zero if the sum of each funnel breadth is less than or equal to $B/4$ at all elevations along the funnels height;
   A — side projected area, in m^2, of the hull, superstructures, deckhouses and funnels above the summer load waterline which are within the equipment length of the ship. The total side projected area of the funnels shall be considered in the side projected area of the ship, A, when A_{FS} is greater than zero. The shielding effect of funnels in transverse direction may be considered in the total side projected area, i.e., when the side projected areas of two or more funnels fully or partially overlap, the overlapped area needs only to be counted once.".

4 **Para 3.2.3** is replaced by the following text:

"**3.2.3** Main gallows, ladders and pile drivers for lifting the ladders of dredgers may be ignored when determining h; when determining the value A, the side-projected area of these structures shall be calculated as the area limited by the contour of the structure.".

4 MOORING ARRANGEMENT

5 **Para 4.3.1** is replaced by the following text:

"**4.3.1** The number and position of mooring bollards, fairleaders and other mooring equipment depend on the constructional features, purpose and general arrangement of the ship.

Shipboard fittings may be selected from an industry standard accepted (approved) by the Register in accordance with ship design minimum breaking load selected from Table 3.1.3-1.

When the shipboard fitting is not selected from an accepted (approved) industry standard, the strength of the fitting and of its attachment to the ship shall be in accordance with 4.3.4 and 4.3.5.

Mooring bitts (double bollards) are required to resist the loads caused by the mooring line attached in figure-of-eight fashion (refer to Note). For strength assessment beam theory or finite element analysis using net scantlings (without corrosion additions and wear down allowances specified in 4.3.5) shall be applied, as appropriate. Load tests may be accepted as alternative to strength assessment by calculations.

N o t e . With the line attached to a mooring bitt in the usual way (figure-of-eight fashion), either of the two posts of the mooring bitt can be subjected to a force twice as large as that acting on the mooring line. Disregarding this effect, depending on the applied industry standard and fitting size, overload may occur.".

6 **Para 4.3.4.1** is replaced by the following text:

"**4.3.4.1** The minimum design load applied to supporting hull structures for shipboard fittings shall be 1,15 times the ship design minimum breaking load of the mooring line according to Table 3.1.3-1.".

7 **Para 4.3.4.4** is replaced by the following text:

"**4.3.4.4** The design load shall be applied to fittings in all directions that may occur by taking into account the arrangement shown on the towing and mooring arrangements plan.

However, in no case does the design load applied to the fitting need to be greater than twice the design load on the line.

N o t e s : 1. Side-projected area including that of deck cargoes shall be taken into account for selection of mooring lines and the loads applied to shipboard fittings and supporting hull structure. The nominal capacity condition is defined as the theoretical condition where the maximum possible deck cargoes are included in the ship arrangement in their respective positions. For container ships the nominal capacity condition represents the theoretical condition where the maximum possible number of containers is included in the ship arrangement in their respective positions.

2. The increase of the minimum breaking strength for synthetic ropes according to IACS recommendation No. 10 needs not to be taken into account for the loads applied to shipboard fittings and supporting hull structure.

The arrangement of reinforced members beneath shipboard fittings, winches and capstans shall consider any variation of direction (horizontally and vertically) of the mooring forces acting upon the shipboard fittings, refer to Fig. 5.3.6. Proper alignment of fitting and supporting hull structure shall be ensured.

The acting point of the mooring force on shipboard fittings shall be taken at the attachment point of a mooring line or at a change in its direction. For bollards and bitts the attachment point of the mooring line shall be taken not less than 4/5 of the tube height above the base, refer to Fig. 4.3.4, *a*. However, if fins are fitted to the bollard tubes to keep the mooring line as low as possible, the attachment point of the mooring line may be taken at the location of the fins, refer to Fig. 4.3.4, *b*.

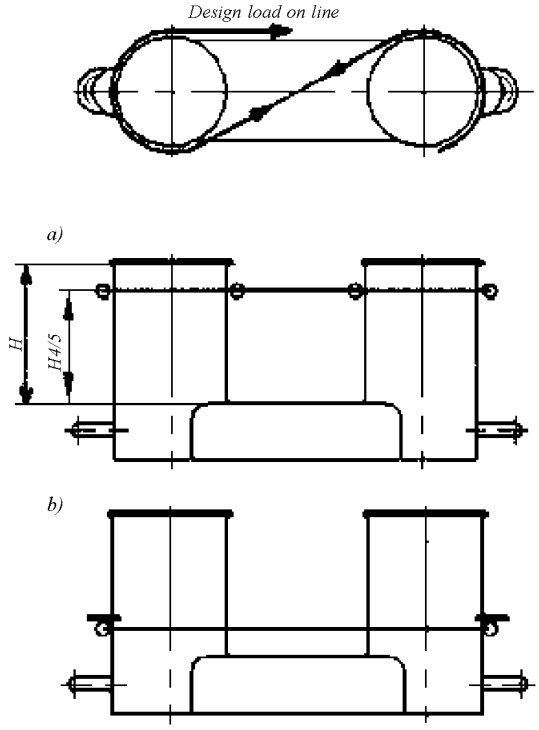

Fig. 4.3.4".

8 **Paras 4.3.5** and **4.3.6** are replaced by the following text:

"**4.3.5** The total corrosion addition t_c, shall not be less than the following values:

for ships covered by the IACS Common Structural Rules for Bulk Carriers and Oil Tankers[1]: total corrosion addition shall be as defined in these Rules;

other ships:

for the supporting hull structure, according to Part II "Hull" for the surrounding structure (e.g. deck structures, bulwark structures);

for pedestals and foundations on deck which are not part of a fitting according to an accepted (approved) industry standard, 2,0 mm;

for shipboard fittings not selected from an accepted (approved) industry standard, 2,0 mm.

Wear allowance:

in addition to the corrosion addition the wear allowance t_w, for shipboard fittings not selected from an accepted (approved) industry standard shall not be less than 1,0 mm, added to surfaces which are intended to regularly contact the line.

[1] Hereinafter referred to as "the IACS Common Structural Rules".

4.3.6 Safe working load (*SWL*) of shipboard fittings used for mooring purpose shall not exceed the ship design minimum breaking load determined according to 4.3.4. The *SWL*, in t, of each shipboard fitting shall be marked (by weld bead or equivalent) on the deck fittings used for mooring.".

9 **Para 4.5.2** is replaced by the following text:

"**4.5.2** Information provided on the plan shall include in respect of each shipboard fitting intended for mooring and towing purposes:

location on the ship;

fitting type;

SWL/TOW;

purpose (mooring/harbour towing/other towing);

manner of applying towing or mooring line load including limiting fleet angles i.e. angle of change in direction of a line at the fitting.

Furthermore, information provided on the plan shall include:

the arrangement of mooring lines showing number of lines (*N*);

the ship design minimum breaking load (MBL_{SD});

the acceptable environmental conditions as given in IACS recommendation No. 10, for the recommended ship design minimum breaking load for ships with Equipment Number $EN > 2000$:

30 s mean wind speed from any direction (v_W or v_W^* according to IACS recommendation No. 10);

maximum current speed acting on bow or stern (±10°).".

5 TOWING ARRANGEMENT

10 **Para 5.3.4** is replaced by the following text:

"**5.3.4** The minimum design load applied to supporting hull structures for shipboard fittings shall be:

.1 for normal towing operations — 1,25 times the intended maximum towing load (e.g. static bollard pull) as indicated on the towing and mooring arrangements plan;

.2 for other towing service — the ship design minimum breaking load according to Table 3.1.3-1 based on the ship's Equipment Number;

.3 for fittings intended to be used for, both, normal and other towing operations, the greater of the design loads according to 5.3.4.1 and 5.3.4.2.".

11 **Para 5.3.7** is replaced by the following text:

"**5.3.7 Shipboard fittings.**

Shipboard fittings may be selected from an accepted (approved) industry standard by the Register and at least based on the following loads:

.1 for normal towing operations, the intended maximum towing load (e.g. static bollard pull) as indicated on the towing and mooring arrangements plan;

.2 for other towing service, the ship design minimum breaking load of the tow line according to IACS recommendation No. 10 (refer to Notes in 4.3.4);

.3 for fittings intended to be used for, both, normal and other towing operations, the greater of the loads according to 5.3.7.1 and 5.3.7.2.

When the shipboard fitting is not selected from an accepted (approved) industry standard, the strength of the fitting and of its attachment to the ship shall be in accordance with 5.3.4 and 5.3.5.

Towing bitts (double bollards) are required to resist the loads caused by the towing line attached with eye splice. For strength assessment, beam theory or finite element analysis using net scantlings (without corrosion additions and wear down allowances specified in 4.3.5) shall be applied, as appropriate. Load tests may be accepted as alternative to strength assessment by calculations.".

12 **Para 5.3.8.1** is replaced by the following text:

"**5.3.8.1** *TOW* is the safe load limit of shipboard fittings used for towing purpose.".